

A NEW SPECIES OF GLUTOPS AND OTHER NEW RECORDS
OF CALIFORNIA TABANOIDEA

(Diptera)

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Through the courtesy of Dr. Paul D. Hurd, Jr., I have had the pleasure of examining a collection of Rhagionidae and the related families Erinnidae and Coenomyiidae from the California Insect Survey at Berkeley. In all 30 species and 540 specimens were represented. The most important records are presented here, together with a few distributional and descriptive notes. I am also greatly indebted to Dr. Frank R. Cole of Redlands, California, for the opportunity to study some specimens from his collection of the very rare genus *Glutops*, including a new species here described. Mr. Alexander A. Hubert of Hamilton, Montana, gave me the benefits of his intensive study of *Symphoromyia* on points of synonymy just as this paper was going to press. I also wish to thank Dr. L. L. Pechuman of Lockport, New York for his critical comparisons, loans of specimens, and other valuable assistance.

FAMILY COENOMYIIDAE

GENUS GLUTOPS BURGESS

Glutops Burgess, 1878, Proc. Boston Soc. Nat. Hist., 19: 321 (Genotype: *Glutops singularis* Burgess, monobasic).

The genus *Glutops* has interested dipterists generally because specimens are rare in collections, and because the face has on each side a peculiar bulbous prominence which is especially swollen and covered with long hairs in the males. Only two species have previously been known, each from only a few specimens. One of these species was represented in the California material examined, as well as a third undescribed species.

GLUTOPS ROSSI Pechuman

Glutops rossi Pechuman, 1945, Canad. Ent., 77: 134.

This species has previously been known only from British Columbia (type locality: Port Haney) and Montana. I have examined the following specimens from California:

1 ♀ Pine Creek, Modoc County, July 18, 1948, W. W. Wirth (el. 7000 ft.) (in U. S. National Museum); 1 ♂, Point Reyes, Marin County, June 5, 1949, R. E. Ryckman (U. S. N. M.); 1 ♀, Lone Pine, Inyo County, July 28, 1940, L. J. Lipovsky (Kansas Univ. collection); 1 ♂, Mt. Home Canyon, June 8, F. R. Cole (Cole collection).

Glutops punctata Wirth, new species

Female. Length 10 mm., wing 10.4 mm. by 2.6 mm.

Head pearly gray pollinose; frons 0.43 times as broad as greatest width of head across eyes in dorsal view; ocellar triangle about equilateral, on a very prominent tubercle, the distance from the anterior ocellus to bases of antennae about 0.4 of width of frons. Facial prominences not quite as strong as in *G. singularis* Burgess, with much denser, coarser, black hair. Palpi orange yellow, nearly as long as antennae, apices abruptly bent downwards, each with a flattened, bare dorsal area, and not broader than basal portions. Labium brownish and expanded in a distally flattened, ovoid disc apparently suitable for use as a suction cup in feeding. Antennae with first and second segments pruinose buff-colored, with numerous long, stout, black hairs; combined lengths of first two segments 0.7 of length of third segment. Third segment with nine indistinct annuli, basal annulus concolorous with preceding segments, second to fifth bright orange, very little broader than basal segments, sixth and succeeding annuli jet black and slender. *Thorax* pruinose gray, appearing mottled due to minute black punctations at bases of the numerous, strong, black hairs over all surfaces. Three very narrow, indistinct, black, longitudinal vittae on dorsum. Legs reddish brown, coxae with dense, dark gray pollen. Legs with very short black hairs except those on coxae, those in a ventral tuft at apex of each fore trochanter, and those on posteroventral surface of all femora, which are long. Wings with membrane reddish brown infumated, the veins very little darker. Halteres with yellowish stems, grayish brown knobs. *Abdomen* pearly gray pollinose, with vestiture of coarse black hairs, each hair with a strong, rounded, black spot at base, these spots usually broader than the distances across the intervening gray ground color between them. Base of third tergite with a mesal row of about fifteen small, oval, polished black sensory pits in a transverse depression, posterior tergites and sternites each with a few scattered pairs of similar sensoria as in the genotype. Sixth and succeeding segments greatly compressed and telescoped and yellowish brown in color.

Male. Specimen badly damaged, third antennal segments and abdomen missing. As in the female with the usual sexual differences, the most striking consisting of the enormously swollen facial prominences and the greater length of the body hairs, the facial prominences and scutellum appearing especially hirsute, but not nearly so much as in *G. singularis*. Eyes broadly contiguous above. Mesonotum darker slate-colored gray, the vittae very faint. Wing 10.0 mm. by 2.3 mm.

Wirth, new species

Holotype ♀, FALLEN LEAF LAKE, LAKE TAHOE, CALIFORNIA, July 2, 1915, E. C. Van Dyke (deposited in the California Academy of Sciences). *Allotype*, Agassiz, British Columbia, June, 1915, R. C. Treherne (F. R. Cole collection). *Paratypes* 1 ♀, Homestead Inn, Mt. Hood, Oregon, June 30, 1927, E. C. Van Dyke (deposited in U. S. National Museum); 1 ♀, Trinity County, California, May 27, 1934, T. G. H. Aitken (California Insect Survey collection);

1 ♀, Yeomatt, Washington, June 3, 1929, V. Tartar (C. E. Philip collection).

The Agassiz, British Columbia, specimen was originally reported by Gibson (1916, 47th Ann. Rept. Ent. Soc. Ontario, p. 154) as *G. singularis* Burgess, but Pechuman (l.c.) not being able to locate the specimen, was naturally inclined to believe that it probably referred to his western species *G. rossi*. *G. singularis* has been recorded only from the northeastern states of New Hampshire, Massachusetts, Connecticut, New York and Pennsylvania. I am indebted greatly to Dr. Pechuman, to Dr. Marion E. Smith of the University of Massachusetts, and to Dr. C. H. Curran of the American Museum of Natural History for the loan of five female specimens of *G. singularis* for comparison with my western species, thus enabling me to study both sexes of each of the three species together. I am therefore able to present the following key for their separation:

KEY TO THE SPECIES OF GLUTOPS

1. Antennae and legs black, halter knobs whitish, mesonotum with broad, dark gray vittae; wings with veins dark colored; length about 6 mm.
.....*rossi* Pechuman
- Antennae yellowish to orange at bases, only extreme apices black; legs reddish brown; halter knobs infuscated; mesonotum with narrow dark brown or black vittae; length 8-10 mm.....2
2. Body hairs coarse, each arising from a round black dot; wing membrane dark brown, concolorous with borders of veins; mesonotal vittae black; antennae with first two segments combined half as long as third segment, the latter not swollen in middle; ocellar triangle equilateral; length 10 mm.....*punctata* Wirth
- Body hairs fine, not arising from black dots, the body rather uniformly pollinose gray; wing membrane pale, contrasting strongly with dark brown-bordered veins; mesonotal vittae brown; antennae with first two segments combined over two-thirds as long as third segment, the latter considerably swollen in middle; ocellar triangle longer than broad; length 8 mm.....*singularis* Burgess

FAMILY RHAGIONIDAE

GENUS VERMILEO MACQUART

VERMILEO OPACUS (Coquillett)

Vermileo opacus (Coquillett), 1904. Inv. Pac. 1:21 (*Pheneus*); Swezy, 1929, Proc. Hawn. Ent. Soc. 7:231; Leonard, 1930, Amer. Ent. Soc. Mem. 7:32; Pechuman, 1938, Bull. Brooklyn Ent. Soc. 33:84.

Coquillett described *V. opacus* from a male from Ormsby County, Nevada; Leonard added a record from Alamogordo, New Mexico; and Pechuman described the female from Pasadena, Cali-

fornea and added a record from Zion Canyon, Utah. In the U. S. National Museum there is a female of *V. opacus* collected at Yosemite, California, at 3000 feet altitude by W. M. Wheeler which had been determined by him as *V. comstocki*. I have also seen a male and female from the California Insect Survey, taken at Snowline Camp, Eldorado County, California, July 22, 1948, by J. W. MacSwain.

VERMILEO COMSTOCKI Wheeler

Vermileo comstocki Wheeler, 1918, Proc. N. England Zool. Club 6:83; Greene, 1926, Proc. U. S. Nat. Mus. 70:12; Leonard, 1930, Amer. Ent. Soc. Mem. 7:71; Leonard, 1931, Trans. Amer. Ent. Soc. 57:323; Pechuman, 1938, Bull. Brooklyn Ent. Soc. 33:87.

Wheeler collected his type series of *V. comstocki* at Alta Meadow, near Sequoia National Forest, California, elevation 9000 feet. Pechuman gives the location of the holotype as the Museum of Comparative Zoology at Cambridge, Massachusetts; there are five specimens labelled as cotypes in the U. S. National Museum. I have also examined 1 male, Sentinel Dome, California, June 19, 1938, E. O. Essig, elevation 8117 feet (California Insect Survey), 1 female, same data (U.S.N.M.), and 1 female, Strawberry, Tuolumne County, California, July 15, 1951, J. W. MacSwain (C.I.S.). All the known localities for *V. opacus* are at an elevation indicating an Upper Sonoran distribution, while the *V. comstocki* localities are Transition or above.

GENUS SYMPHOROMYIA FRAUENFELD

This genus is especially important as it contains the only blood-sucking members of the family Rhagionidae in North America. In the mountains of the northern and western parts of the country these biting snipe flies are as annoying and painful biters as members of the Tabanidae. Aldrich's (1915, Proc. U. S. Nat. Mus. 49:113-142) revision of the North American species still stands as the authoritative work and although excellent, badly needs to be brought up to date with a study of the male genitalia. Species reported by Aldrich to take blood include *atripes* Bigot, *flavipalpis* Adams, *hirta* Johnson, *inquisitor* Aldrich, *pachyceras* Williston and possibly *kincaidii* Aldrich. I captured a female of *sackeni* Aldrich (near Saratoga, Santa Clara County, California, July 8, 1948) in the act of biting painfully.

I have identified the following California species of *Symphoromyia* in the California Insect Survey collection.

1. *atripes* Bigot. 78 ♀♀, Echo Lake, Eldorado County; Delany Creek,

- Yosemite; White Mountain, Inyo County; Gaylor Lakes, Yosemite; Hope Valley, Alpine County; Young Lakes, Yosemite.
2. *fulvipes* Bigot. 34 ♀ ♀, Hat Lake, Lassen County; Donner Pass, Nevada County; North Park, Mirror Lake, Young Lakes, Yosemite; Echo Lake, Eldorado County; Hope Valley, Alpine County; Buck's Lake, Plumas County; Mt. Raymond, Madera County; Tuolumne Meadows, Tuolumne County; Dark Creek, Tahquitz Valley, Idyllwild, San Jacinto Mountains. [I believe that *flavipalpis* Adams from Utah, which apparently differs mostly in its darker femora, will eventually prove to be a synonym of *fulvipes*, while *hirta* Johnson, with a much narrower frons and broad mesotonal bands should be restricted to the eastern form. All of Aldrich's Rocky Mountain records of *hirta* should be transferred to *flavipalpis*].
 3. *johnsoni* Coquillett. 2 ♂ ♂, 25 ♀ ♀, Keen Camp and Pine Grove, San Jacinto Mountains; Echo Lake, G. Alpine Creek, Lake Forest, Tahoe; Spaulding's, Lassen County; Buck's Lake, Plumas County; Miami Ranger Station, Mariposa County.
 4. *kincaidi* Aldrich. 1 ♀, Mirror Lake, Yosemite, July 20, 1936, W. G. Herms.
 5. *limata* Coquillett. 108 ♀ ♀, Idyllwild, Ribbonwood, Keen Camp, Pine Grove, Santa Rosa Mountain, Herkey Creek, San Jacinto River, San Jacinto Mountains; Tanbark Flat, Camp Baldy, Van Nuys, Pasadena, Los Angeles County; Poppet Flat, Riverside County; Hastings Refuge, Monterey County; Portola State Park, San Mateo County.
 6. *montana* Aldrich. 22 ♂ ♂, 3 ♀ ♀, Hope Valley, Alpine County; Bridge Creek Camp, Lassen County; Triple Peak Fork, Yosemite; Sardine Creek, Mono County.
 7. *pachyceras* Williston. 4 ♂ ♂, 23 ♀ ♀, Mt. Hamilton and San Antonio Valley, Santa Clara County; Cypress Ridge, Lagunitas Creek, Marin County; Sunol, Alameda County; Ryan Creek, Mendocino County; Hat Creek, Shasta County; Echo Lake, Eldorado County; Young Lakes, Yosemite.
 8. *plagens* Williston. 4 ♂ ♂, 6 ♀ ♀, Trinity County; Donner Pass, Nevada County; Green Valley Park, Solano County; China Flat, Echo Lake, Eldorado County; Strawberry, Tuolumne County; Mt. Raymond, Madera County; Frazier Mt., Kern County.
 9. *sackeni* Aldrich. 5 ♂ ♂, 92 ♀ ♀, Pine Grove, San Jacinto River, Idyllwild, Dark Creek, San Jacinto Mountains; Tanbark Flat, Big Dalton Dam, Pasadena, Los Angeles County; Loma Prieta, Santa Clara County; Frazier Mountain, Kern County; Davis, Yolo County; Pepperwood, Scotia, Yosemite.
 10. *securifera* Coquillett. (see below 13 ♀ ♀).
 11. *varicornis* (Loew). 4 ♀ ♀, Phoenix Lake, Taylor State Park, Marin County; Oak Grove, San Diego County.

Of the above listed species, Aldrich did not include California records of *fulvipes* and *montana*, and the present records are thus apparently new for the state. However, Aldrich listed the following

species from California, *cinerea* Johnson, *cruenta* Coquillett, *pilosa* Aldrich and *trucis* Coquillett, which I did not find in the Survey collection.

SYMPHOROMYIA SECURIFERA coquillett

Symphoromyia securifera Coquillett, 1904, Proc. Ent. Soc. Wash. 6:171; Aldrich, 1915, Proc. U. S. Nat. Mus. 49:140.

SPECIMENS EXAMINED: 12 ♀♀, Tanbark Flat, Los Angeles County, California, June 20, 1950, J. W. MacSwain; 2 ♀♀, same locality, June 20 and 25, 1950, P. D. Hurd (in collections of U.S.N.M. and California Insect Survey).

Aldrich's description of *securifera* from a female collected by Osten Sacken in Sonoma County, California, differs so much from the type female described by Coquillett from Santa Clara County, that I believe it advisable to redescribe the species again based on fresh material. The type agrees with these Tanbark Flat specimens except that the legs are, as described by Aldrich, mostly yellow. Aldrich's figure 11², allegedly of the mid coxa of *securifera*, is referred by him in his later notes to *johnsoni*. This clump of modified black spines on the outer side of the mid coxa is found, as stated earlier in Aldrich's paper (p. 114) in males of several species in the group with a concave third antennal segment.

Female. Length 5.7 mm. Front half as wide as one eye, densely gray pollinose, with rather long, coarse, black pile; slightly bulging on each side below ocellar triangle, the latter on prominent elevation. First antennal segment pollinose gray, short and slightly swollen, with coarse black pile; second segment less than a fourth as long as first; third segment pubescent black, concave below the black arista, much elongated below, its length equal to length of entire antenna to base of arista. Face bare, grayish-white pollinose; palpi orange-yellow, broad beyond middle, with whitish pile; labellae fleshy, blackish; beard white.

Mesonotum densely gray pollinose, with coarse black pile rather short except long in front of scutellum; with three very marked brownish-black longitudinal vittae, the median vitta very narrow, the gray areas between this and lateral vittae subequal in breadth to that of the latter. Scutellum gray, with long black pile; pleura finely gray pollinose, with very fine whitish pile, propleura and metapleura with dense long white pile. *Legs* black; coxae gray pollinose, with dense white pile, mid coxae without spine-like clump of bristles; femora with very fine, short, white pile mixed with black pile on fore legs; fore and mid knees yellowish; fore and mid tibiae brownish; tarsi black. *Wings* grayish hyaline, veins dark brown, becoming yellowish at base of wing. Halteres entirely yellow. *Abdomen* densely gray pollinose, tergites each with a rather elongated, median, brownish spot, those on posterior segments usually somewhat broader and less distinct; pile on first tergite and on venter white, on distal tergites black and coarse.

² Likewise Aldrich's figures 4 and 5, p. 130, should refer to *sackeni* Aldrich, and not, as labeled, to *kincaidi* Aldrich.